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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,602	04/01/2004	Takashi Shirakawa	023971-0394	5890

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FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER	
EDWARDS, LOREN C	

ART UNIT	PAPER NUMBER
3748	

DATE MAILED: 05/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/814,602	SHIRAKAWA ET AL.	
	Examiner	Art Unit	
	Loren C. Edwards	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Response filed 1/13/06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-16* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/13/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. An Applicant's Amendment filed on 1/13/06 has been entered. Claims 1, 3, 6, 15, and 16 have been amended. Overall, claims 1-16 are pending in the application.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been placed in the file of record

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 1/13/06 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 7-10 and 14-16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Adamczyk et al. (U.S. RE38,051). Adamczyk discloses an exhaust-aftertreatment-apparatus diagnosis system for an internal combustion engine, comprising: an exhaust ambiance varying section (Figs. 6 and 7) varying a ratio between an oxidizing agent and a reducing agent in exhaust gas of the engine; an exhaust aftertreatment apparatus (Fig. 1, No. 20) disposed in an exhaust passage of the engine, the exhaust aftertreatment apparatus selectively executing an adsorbing

operation and a reducing operation of the exhaust gas according to the ratio; a first exhaust ambience detector (Fig. 1, No. 16; Claim 16) disposed upstream of the exhaust aftertreatment apparatus, the first exhaust ambience detector detecting a first ratio between the oxidizing agent and the reducing agent of the exhaust gas upstream of the exhaust aftertreatment apparatus; a second exhaust ambience detector (Fig. 1, No. 24; Claim 16) disposed downstream of the exhaust aftertreatment apparatus, the second exhaust ambience detector detecting a second ratio of the oxidizing agent and the reducing agent of the exhaust gas downstream of the exhaust aftertreatment apparatus; a first deterioration diagnosing section (Fig. 5; Claim 16) diagnosing a deterioration of the exhaust aftertreatment apparatus on the basis of the first and second ratios of the first and second ratios obtained under a first engine operating condition when the exhaust ambience is changed; and a second deterioration diagnosing section (Figs. 6 and 7; Claim 16) diagnosing the deterioration of the exhaust aftertreatment apparatus on the basis of the second ratio obtained under a second engine operating condition when the first deterioration diagnosing section diagnoses that the exhaust aftertreatment apparatus is deteriorated.

6. With regards to claim 2, Adamczyk discloses the diagnosis system of claim 1, as described above, and further wherein the first deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus when the engine operating condition is changed from a lean burn operation to a rich burn operation or from rich burn operation to the lean burn operation (Col. 5, Lines 3-16; Figs. 2-5; Claim 16).

7. With regards to claim 3, Adamczyk discloses the diagnosis system of claim 2, as described above, and further wherein the first deterioration diagnosing section comprises an integral section (Col. 3, Line 26 – Col. 4, Line 33) for calculating an integral quantity of a difference between an output of the first exhaust ambience detector and an output of the second exhaust ambience detector from a first moment that the output of the first exhaust ambience detector is varied to a predetermined value to a second moment that the output of the second exhaust ambience detector is varied to the predetermined value, and the first deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus on the basis of the integral quantity.

8. With regards to claim 4, Adamczyk discloses the diagnosis system of claim 1, as described above, and further wherein the second deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus by transiting the engine operating condition to a stoichiometric air/fuel ratio operating condition (Fig. 6; Col. 3, Lines 45-58).

9. With regards to claim 7, Adamczyk discloses the diagnosis system of claim 1, as described above, and further wherein the first engine operating condition, under which the first deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus, includes a rich spike control condition (Col. 3, Lines 45-48) wherein the engine operating condition is temporarily varied from a lean burn condition to a rich burn condition.

10. With regards to claim 8, Adamczyk discloses the diagnosis system of claim 1, as described above, and further wherein the second engine operating condition, under which the second deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus, includes a stoichiometric air/fuel ratio control (Fig. 6; Col. 3, Lines 45-58).

11. With regards to claim 9, Adamczyk discloses the diagnosis system of claim 1, as described above, and further wherein the exhaust aftertreatment apparatus selectively executes an adsorbing operation of nitrogen oxide in the exhaust gas and a reducing operation of the nitrogen oxide (Abstract, Col. 16).

12. With regards to claim 10, Adamczyk discloses the diagnosis system of claim 1, as described above, and further wherein the first deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus on the basis of the first and second ratios obtained after an operation for temporally varying the engine operating condition from a lean burn condition to a rich burn condition (Col. 3, Line 26 – Col. 4, Line 33).

13. With regards to claim 14, Adamczyk discloses the diagnosis system of claim 1, as described above, and further wherein the first deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus on the basis of a change of a catalyst downstream side air/fuel ratio relative to a change of a catalyst upstream side air/fuel ratio during a rich spike control (Figs. 2-7; Claim 16), and the second deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus from an inversion cycle (Fig. 6) of a feedback quantity during

the feedback control of the catalyst downstream side air/fuel ratio during a stoichiometric control when the first deterioration diagnosis made a deterioration determination.

14. With regards to claim 15, all of the elements of claim 1 are included in the method claim 15 and the method to so perform is inherently included.

15. With regards to claim 16, Adamczyk discloses an exhaust-aftertreatment-apparatus diagnosis system for an internal combustion engine (Abstract), comprising: exhaust ambience varying means (Abstract; Claim 16) for varying a ratio between an oxidizing agent and a reducing agent in exhaust gas of the engine; exhaust aftertreatment means (Fig. 1, No. 20) for purifying the exhaust gas by selectively executing an adsorbing operation and a reducing operation of the exhaust gas according to the ratio varied by the exhaust ambience varying means, the exhaust aftertreatment means being disposed in an exhaust passage of the engine; first exhaust ambience detecting means (Fig. 1, No. 16) for detecting a first ratio between the oxidizing agent and the reducing agent of the exhaust gas upstream of the exhaust aftertreatment apparatus, the first exhaust ambience detecting means being disposed upstream of the exhaust aftertreatment apparatus; second exhaust ambience detecting means (Fig. 1, No. 24) for detecting a second ratio of the oxidizing agent and the reducing agent of the exhaust gas downstream of the exhaust aftertreatment apparatus, the second exhaust ambience detecting means being disposed downstream of the exhaust aftertreatment apparatus; first deterioration diagnosing means (Fig. 5; Claim 16) for diagnosing means for diagnosing a deterioration of the exhaust aftertreatment

apparatus on the basis of the first and second ratios obtained under a first engine operating condition when the exhaust ambience is changed; and second deterioration diagnosing means (Figs. 6 and 7; Claim 16) for diagnosing the deterioration of the exhaust aftertreatment apparatus on the basis of the second ratio under a second engine operating condition when the first deterioration diagnosing means diagnoses that the exhaust aftertreatment apparatus is deteriorated.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. Claims 6, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adamczyk in view of Shigapov et al. (U.S. 6,813,884). Adamczyk discloses the system of claim 1, as described above, but fails to specifically disclose the system being attached to a compression ignition. Shigapov discloses the existence of a catalyst in a diesel engine application (Fig. 1). It would have been obvious to one having ordinary

skill in the art at the time the invention was made to utilize the diesel engine of Shigapov in the system of Adamczyk for the advantage of increased fuel efficiency.

19. With regards to claim 11, the modified Adamczyk discloses the diagnosis system of claim 1, as described above, and further wherein the exhaust aftertreatment apparatus comprises a NOx trap catalyst (Shigapov, Fig. 2, No. 15).

20. With regards to claim 12, the modified Adamczyk discloses the diagnosis system of claim 11, as described above, and further wherein the exhaust aftertreatment apparatus comprises a diesel particulate trap disposed downstream of the NOx trap catalyst (Shigapov, Fig. 2, No. 16).

21. With regards to claim 13, the modified Adamczyk discloses the diagnosis system of claim 12, as described above, and further wherein the exhaust aftertreatment apparatus comprises an oxidizing catalyst disposed upstream of the NOx trap catalyst (Shigapov, Fig. 2, No. 12).

Allowable Subject Matter

22. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

23. Applicant's arguments with respect to claim 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Tamura et al. (U.S. 2003/0115854), Surnilla et al. (U.S. 6,594,985), Sato et al. (U.S. 6,640,540), Cullen et al. (U.S. 6,467,254), and Herzberg (U.S. 6,637,198).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Loren C. Edwards whose telephone number is (571) 272-2756. The examiner can normally be reached on M-TH 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Loren Edwards

THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700